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Art. III. — *An Introduction to Entomology, or Elements of the Natural History of Insects; comprising an Account of Noxious and Useful Insects, of their Metamorphoses, Food, Stratagems, Habitations, Societies, Motions, Noises, Hybernation, Instinct, &c.* With Plates. By William Kirby and William Spence. From the sixth London Edition, which was corrected and considerably enlarged. Philadelphia: Lea & Blanchard. 1846. 8vo. pp. 600.

The question, whether the human mind differs from that of the brute in kind, or only in degree, is one that has exercised the wits both of ancient and modern philosophers, though but to little purpose. It is not likely that the doubt will ever be entirely resolved, as we are altogether ignorant of the inward nature, the essential constitution, of both subjects of inquiry. We can compare only the outward acts, and thence dimly infer radical differences of internal organization. The *acts*, we say, not the *qualities*; for as any two material substances are distinguishable from each other only by their attributes or qualities, in other words, by the different impressions which they make on our senses, it would seem at first sight as if we might separate the mental constitution of man from that of the lower animals as easily as the mineralogist divides quartz from feldspar. But it is not so; intellect differs from instinct, not as chalk differs from flour, but rather as gravitation differs from chemical affinity, or the unknown principle of heat from the equally subtile and obscure essence of light. With respect either to the human or the brute mind, we can ask *what it does*; it would be wholly futile to inquire *what it is*. Now, there is no action whatever, considered merely as a visible fact, as an exercise of nerves and muscles, which many brutes cannot perform nearly or quite as well as men. They walk, leap, run, and climb; they eat, drink, and propagate their species; they weep, cry, and even articulate.*

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* *Laughter* may be considered as an exception to our remark, since the laughing hyena will hardly be admitted as a case in point. We reply, that the word *laughter* indicates not merely a visible act, but also the feeling of which this act is the exponent. Animals are susceptible of the emotion, and can perform the act, but they combine them differently; they express this particular emotion in a different manner, and this particular act with them

From their outward acts alone, then, it seems impossible to deduce the characteristic feature of their mental nature. Luckily, a third question remains to us, the answer to which directly involves the subject of our present inquiry, while it appears to be within the reach of human investigation. In regard either to instinct or intelligence, though we cannot tell what it is, we may ascertain *what it is not.* As we affirm without hesitation that mind is not material, so we may find sure reason to believe that it is radically different from instinct. And this is our present object.

The unsatisfactory character of most speculations upon the mind of brutes seems to have proceeded from overlooking the distinction here pointed out, and attempting to discover the *cause*, instead of merely pointing out the *characteristics*, of the phenomena in question. It would be well to show what thought, reason, and reflection are, inquiries in which we have the direct testimony of consciousness to aid us, before we grapple with the far more difficult problem respecting the origin and nature of instinct. The pretended solutions of this problem are wholly hypothetical and unsatisfactory. Descartes considers all animals inferior to man as mere machines ; a supposition so extravagant, that some have supposed that his language, though apparently very explicit, has been misunderstood, and that he meant to say only that brutes did not act from their own free will, but were constantly under the guidance of a superior power. This supposition agrees in the main with the doctrine of Newton and Addison, who maintain that animals act only as they are immediately moved by their Creator. The hypothesis is certainly intelligible, though it appears as yet devoid of proof, and it is open to the obvious objection, that many of the arbitrary and purposeless actions of animals appear quite inconsistent with the infinite wisdom which framed their bodies with such marvellous skill, that not a joint, muscle, or fibre exists without an obvious use. To avoid this difficulty, Mr. French supposes that animals act only as they are moved, not indeed by the Deity, but by a class of superior agencies or beings who fill the void between man and the Creator. As this is a mere hypothesis, and a very unsatisfactory one too,

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indicates a different emotion. The grin of a beast shows its ferocity, while that of a man indicates merriment. But two dogs gambolling together show mirth as clearly as two men laughing at each other.

since it refers mysterious effects to causes still more mysterious, and wholly beyond the range of human knowledge, it hardly deserves serious refutation.

Mr. Kirby proposes, but with much apparent hesitation, another theory, which really coincides, though the author seems not to be aware of the fact, with the doctrine of Descartes. He supposes, that all the phenomena of instinct are produced by physical action upon the varied organization of animals ; that light, heat, electricity, and perhaps other agencies still more subtile, exert as much influence upon the actions of animals as upon the growth of plants. He compares "the sunflower and the hive-bee, the compound flowers of the one, and the aggregate of combs of the other, — the receptacle with its seeds, and the combs with the grubs." The analogy here is so far-fetched that it is hardly any analogy at all, for the author compares the *body* of the sunflower not with the *body*, but with the *works*, of the bee. The phenomena of growth have no similarity with those of action ; we might as well compare fermentation with falsehood. The sunflower properly resembles, not the bee, but the hive.

But argument is not needed to expose the futility of such speculations. An attempt to explain the ultimate *cause* of any phenomena, whether of matter or mind, is a hopeless undertaking ; and it argues only a confusion of ideas, and an ignorance of the proper objects of human inquiry, to make the trial. We investigate the qualities of an object, or determine the character of a phenomenon, with a view only to its proper classification, — to determine its relations to other objects and phenomena, and thereby to assign to it a proper place in the scale of things. We now seek to ascertain the true character of instinct, or rather of the brute mind, of which, perhaps, instinct is only one of the manifestations. We narrow the inquiry still further by asking what the mind of animals is, not in itself considered, but in relation to a single class of other phenomena, the manifestations of the human mind. Is instinct only a lower degree of intelligence, or a modification of it, or is it wholly peculiar and distinct, so as not properly to be classed with human reason any more than with electricity ?

It is first necessary to determine the meaning of the word, or to ascertain the phenomena to which the term instinct is usually applied. Some writers speak of "physical instincts," among which they class the beating of the heart, the peristaltic motion of the bowels, the secretions in the animal economy, and the like. But as these motions are regular and involuntary, they are more properly considered as automatic or mechanical, and are classed with the phenomena of life rather than with those of instinct. Operations corresponding to them, or exactly similar, are carried on in vegetables ; and some of them, even in animals after death, may be renewed through the application of a galvanic battery. At any rate, as they are wholly independent of the action of mind, they may be put aside in the present investigation.

As the appetites and passions seek their own gratification without the aid of reason, and frequently in spite of it, they also are often called instinctive in their operation. But these are common to man and the brute, and they differ, at least in one important respect, from those instincts of the lower animals which are usually contrasted with human reason. The objects towards which they are directed are prized for their own sake ; they are sought as *ends*, while instinct teaches brutes to do many things which are needed only as *means* for the attainment of some ulterior purpose. Thus, instinct enables a spider to entrap his prey, while appetite only leads him to devour it when in his possession. Nay, the two impulses often act in opposition to each other, as when the bird restrains its own hunger for the sake of feeding its young. Appetite is blind, and affords a motive, but no guidance, for effort ; instinct, on the other hand, both supplies an object for action, and points out a course for its attainment. It is true that appetite sometimes appears to direct the choice, yet so far only as the want of it leads the animal to reject unsuitable food, and to devour that which is adapted for its physical organization. That a dog will not eat hay, nor a horse swallow raw meat, is no more a proof of instinct, than the corresponding fact in man, that sweet things are pleasant to the taste, while bitters are disagreeable, is an indication of reason.

Yet the two are often confounded both by physiologists and metaphysicians. Thus, the celebrated experiment of Galen is quoted by Dugald Stewart, as it was devised by its author, in order to show that instinct is antecedent to experience, when it only proves that the appetites of animals distinguish between different classes of food, or that they manifest preference and aversion. "On dissecting," says Galen, "a goat great with young, I found a brisk *embryon*, and having detached it from the *matrix*, and snatched it away before it saw its dam, I brought it into a room where there were many vessels, some filled with wine, others with oil, some with honey, others with milk, or some other liquor, and in others there were grains and fruits. We first observed the young animal get upon its feet and walk; then it shook itself, and afterwards scratched its side with one of its feet; then we saw it smelling to every one of those things that were set in the room, and when it had smelt to them all, it drank up the milk." Thereupon Galen and his friends cried out with admiration, "seeing clearly," as he says, "that the natures [actions] of animals come not from instruction," but from instinct. He might also have said, that human actions of this class are equally untaught, for the infant readily accepts its proper food, while it loathes the nauseous medicine.

It is evident that the appetites are called instinctive only because they are not acquired by experience or instruction; they are innate. But this is far from being the only characteristic of what are usually termed the instincts of the lower animals, which often lead to complex and prolonged tasks, involving a constant sacrifice of their natural desires and inclinations. We place the more stress upon this point, because, as will be shown hereafter, if the name of instinct be denied to these original and simple preferences and aversions, there will appear good reason to doubt whether man is ever governed by instinct properly so called, whether all his actions are not reducible to passion, appetite, and reason. Instinct *may* exist in the brute conjointly with a low degree of intelligence; but the intellect of man is pure and unmixed. It may be obscured by appetite, or stormed by passion; habit may render its operations so swift and easy, that we cannot note their succession; but when free from these disturbing forces, it acts always with a full perception of the end in view, and by a deliberate choice of means aims at its accomplishment. Instinct is marvellous and inscrutable in its operations, as much so as reason itself. But that the appetites have their appropriate objects, and reject all others, is no special cause for wonder, any more than the fact that glass transmits light, while it is impervious to air. Such is its original constitution.

How may we describe instinct, then, as distinguished from appetite on the one hand, and from reason on the other, as all three are motives or guides to action ? It is an impulse conceived without instruction, and prior to all experience, to perform certain acts which are not needed for the immediate gratification of the agent, but are useful only as means for the attainment of some ulterior object ; and this object is usually one of preëminent utility or necessity, either for the preservation of the animal's own life, or for the continuance of its species. The former quality separates it from intelligence properly so called, which proceeds only by experience or instruction ; and the latter is its peculiar trait as distinguished from appetite, which in strictness uses no means at all, but looks only to ends.

Instances without number may be adduced to establish the existence of both these characteristic features of instinct. Chickens hatched by steam, which have never seen any older birds of the same species, perform all the duties of incubation and feeding their young as perfectly as if they had been the constant objects of Dame Partlet's care in their own callow infancy. Insects born only after the death of their parents still run the little cycle of their appointed tasks, and make provision for their own future progeny, which they are never to see, with as much labor and foresight as were exercised in preparing and storing their own cradles. In such cases, there is no opportunity for experience, and no source of instruction. Again, certain insects, governing for the moment their own appetites, which would lead them to devour their food as soon as found, store up in subterranean cells a provision for the coming winter, though as yet they have experienced only the warmth and abundance of summer and autumn. The moth with great care collects food of a kind which it never uses for itself, as a provision for its young when in the transition state. Other instances may be found to any extent in works on the several branches of zoölogy ; but these are sufficient for our present purpose.

It is important to look rather at the great number of these unquestioned instances of true instinct, than at a few doubtful cases, in which it may seem difficult to determine whether the action is attributable to instinct or to reason. We may not be able to draw with mathematical precision the line where intelligence begins ; but there is no doubt that a multitude of cases lie far beyond that line, where we cannot hesitate for a moment in assigning them to their proper class. Some naturalists have shown great ingenuity to little purpose in the attempt to resolve into reason one or two instances of what had commonly been considered as instinct, without reflecting that by so doing they required a greater amount, or higher degree, of wisdom than could safely be attributed to a Solomon. One such instance as that of a duck, which had been hatched from an egg laid under a hen, taking to the water immediately after it was released from its shell, to the great consternation of its foster parent, is enough to upset Darwin's whole theory.

Another peculiarity of instinct, and one of the broadest grounds of distinction between it and reason, is that it is not susceptible of improvement or education. It is complete from the beginning ; it makes no progress either in the individual or the race. The bee, as soon after its disclosure from the pupa as its body is dried and its wings expanded, takes its part in the labors of the little commonwealth with as much apparent activity and efficiency as its elders. It collects honey and builds a cell as adroitly in the first as in the last hour of its existence. And so it is with the species ; the internal economy of a hive was just as marvellous in the days of Aristotle and Virgil as in those of Huber. It is sometimes asserted, indeed, that the descendants of animals trained for domestic purposes show greater docility, and may more easily be taught to perform their required tasks, than individuals of the same species whose parents had remained in a wild or undisciplined state. The alleged fact is a very questionable one, and may very probably have arisen from the circumstance, that the training of the former class began at an earlier age than that of the latter. As the imitative principle exists to a greater or less degree in all quadrupeds and birds, the habits of their young must be affected to some extent, from the earliest period of their existence, by observation of the movements of the elder animals around them. If a wild colt could be taken from the prairies *immediately* after it was foaled, and placed at once in the stable or the pasture by the side of the domesticated animal, it would probably show as much docility as the proper offspring of that animal, while a very short experience of entire freedom with the wild herd might render it less tractable. But even if we were to give full credit to the story, it would prove nothing as to the nature of instinct, properly so called, which constitutes only a part of the mental constitution of animals. Some faculties they unquestionably possess in common with man, the imitative principle just alluded to being one of them.

It is important to observe, that the power of instinct in many cases quite transcends that of reason. If it differs from human intelligence not in kind, but in degree only, it is undoubtedly the superior. Man may go to school to the dog, the swallow, and the bee ; but however long a time he may remain there, he will never equal his teacher. Let him attempt, for instance, *without the aid of any tools or machinery*, and with the utmost possible economy of space and material, to construct a symmetrical hexagonal cell, closed at one end by a trihedral pyramid, each side of which is a rhombus, with its obtuse angles measuring precisely 109° 28′, and its acute angles 70° 32′. Without instruments or a pattern, he probably could not cut such a rhombus with perfect accuracy out of a piece of paper after a thousand trials. But the bee does this before it is a day old. And in this statement of the task we have left out the greatest difficulty of all ; we have solved the most abstruse problem in it, so as to make its performance more easy. In order to make the cell with as little wax and space as possible, it is necessary that the angles of the rhombus should have precisely these dimensions and no other. It was only after the invention of the calculus that man was able to determine the angles required for this purpose, or, in other words, to discover how far the wisdom of the bee transcended his own. In Virgil's time, the bee was wiser than the greatest *human* mathematician of its day.

Those who are familiar with the habits of animals can produce a multitude of other instances to show the vast superiority of instinct, in its proper and limited sphere, to the best efforts of the human reason ; especially when we make the proper qualification, that the animal usually works without instruments of any kind, except those furnished in its own body, which affords nothing to be compared, in point of convenience, with the human hand. But we give one other case, which needs not this qualification ; it is found in the explanation of the proverbial phrase, "a bee-line." Remove a man blindfold several miles from his home, by a route with which he is entirely unacquainted, and require him to return to his own door by a mathematically straight line. The bee will do so, but a man's path under such circumstances would probably be rather crooked. And the difference between them cannot be explained on the supposition of the insect's greater sharpness of vision ; let the hive be in the midst of a vast forest, so that the intervening trees hide it when one is a rod off in any direction, and the bee still flies straight to its home.

The consideration of this manifest preëminence of instinct *in its limited sphere* over reason was necessary in order to put in a proper light the next peculiarity of it which we have to notice, and which certainly divides it by a very broad line from any thing in the mental constitution of man. Instinct is limited to a very few ends, mostly to those which are essential for the preservation of the animal itself or of its species. It works in a prescribed and narrow path, to accomplish these purposes and no others ; its methods are invariable, or nearly so, its power of adapting itself to circumstances being confined within a very narrow range. Beyond these limits, it is powerless. Take the animal out of its sphere, and its mental endowments cease to be even comparable with those of man ; it falls infinitely far below him. The bee, which in its own sphere is wiser than a Euclid or an Arkwright, is, when compelled to labor for any other purpose than that for which nature has specifically adapted it, more stupid than an idiot. If one accidentally flies into a room through the lower half of an open window, and, seeking to return, happens to strike against the glass above, it will continue buzzing about and knocking its head against the same pane oftentimes for an hour, though it would find free egress a few inches below. The hen shows great apparent sagacity, during the period of incubation, in preserving the egg from cold or harm of any kind, and, when due time arrives, in assisting the chick to break out of its prison ; but she mistakes a piece of chalk for an egg, and sits upon it in the same manner ; she heeds not any change in the number of her eggs ; and if one of another species be placed in the nest, she cherishes the little stranger, when hatched, with as much care as she shows for her own offspring. In fact, the natural affection of birds, and even of many quadrupeds, for their young is quite blind. A cheat may easily be put upon them, and they may even be deceived into nourishing those that are naturally their deadliest enemies. Cats have been found suckling young rats, a fact which shows the stupidity both of the foster mother and the nursling.

Nothing can be more unlike the action of human reason than such incongruities. The pliability of the mind, its astonishing power of adapting itself to circumstances, is one of its most marvellous attributes. Sagacity shown in one direction is a good test of general ability for all occasions. Increased facility in performing particular tasks may, indeed, be acquired by habit; but the mind is master also of its own habits, forming or destroying them at pleasure. A great deal of nonsense is uttered about men being born for particular employments; and this is said with reference not merely to what is an undoubted fact, the unequal measure of general talent possessed by different individuals, but to a supposed innate bias of that talent towards a particular task. That popular humbug, phrenology, has had a great share in perpetuating this erroneous doctrine, if not in giving birth to it, as well as to many others of the same class. We hold, with Dr. Johnson, that the true genius is a mind of large natural powers accidentally determined in a particular direction. The greatest general of ancient times showed himself also one of the greatest historians; and in our own day, England's most illustrious captain is also her wisest statesman. Posterity will probably rank the civic abilities of Napoleon even higher than his military genius. At this time, the prime minister of France is her most philosophical historian, and his competitors in politics are a distinguished poet and an eminent journalist.

Not so in the orderly little communities of the ant and the bee. The soldiers and the workers have their appointed tasks from the first moment of their existence, and never change their professions. The drones are *born* sluggards. The queen emerges from the pupa with the crown already on her head; she was fed with royal food while still only a worm. After her birth, like a true sovereign, she does nothing but lay eggs and fight, while her subjects support her. And this law of the invariability of instinct holds throughout the animal kingdom. In all that goes beyond the mere sensations of the present moment, in every thing that relates to the future, and therefore requires the use of means, which in a human being would imply sagacity and foresight, the several classes of brutes do one thing in only one way. Following that narrow path, they appear like prodigies of wisdom ; remove them ever so little from it, and they again become — brutes. In this respect, the parallel between the human and the brute mind fails entirely ; instinct is no longer to be compared with reason, but with a machine. The analogy here is perfect ; a jenny or a mule can spin yarn much better than man could with the aid only of his fingers ; but it cannot card, weave, or dress ; it can do nothing but spin. A machine performs a single task, usually with wonderful speed, neatness, and precision ; but its utility is limited to this one purpose. So a bee constructs its combs with admirable art ; but it cannot build a hive, or a house for these combs. If man does not come to its aid with a properly fashioned hive, it will use the hollow of a decayed tree, or some other less convenient receptable. The wasp, on the other hand, builds not only its combs, but a house to cover them with, and it manufactured *paper* for these purposes many centuries before man learned how to make it. Neither the wasp nor the bee can dig subterranean chambers for its home, as the ant does ; but the latter cannot manufacture paper, nor construct combs. Each of these animals, indeed, can perform several tasks of its own ; just like a complex machine, which cuts the wire, sharpens it, and affixes a head to the pin, — doing all, as it were, by a single volition. The operation is complex, but invariable.

We do not say that instinct *is* the action of a machine, but only that it *resembles* one more nearly than it does the curious, flexible, and far-reaching operation of reason. In one respect it is like a cunningly devised engine which admits of several adjustments, so that, though it still performs but one kind of work, it allows of a few variations in its pattern and fabric. These variations are limited in extent, and never amount to a change of the main object in view ; but if accident or man's device interferes with the animal's ordinary mode of attaining that object, it will often slightly modify the operation so as to get rid of the difficulty. Though walking in a narrow path, it can still turn aside a little to the right or the left, so as to avoid an obstruction in the way. We quote from the fascinating work of Kirby and Spence a few instances of this limited flexibility of instinct.

"It is the ordinary instinct of bees to lay the foundation of their combs at the top of the hive, building them perpendicularly *downwards;* and they pursue this plan so constantly, that you might examine a thousand (probably ten thousand) hives, without finding any material deviation from it. Yet Huber in the course of his experiments forced them to build their combs perpendicularly upward; and what seems even more remarkable, in an horizontal direction.

"The combs of bees are always at an uniform distance from each other, namely, about one third of an inch, which is just wide enough to allow them to pass easily and have access to the young brood. On the approach of winter, when their honey-cells are not sufficient in number to contain all the stock, they *elongate* them considerably, and thus increase their capacity. By this extension the intervals between the combs are unavoidably contracted; but in winter well-stored magazines are essential, while from their state of comparative inactivity spacious communications are less necessary. On the return of spring, however, when the cells are wanted for the reception of eggs, the bees contract the elongated cells to their former dimensions, and thus reëstablish the just distances between the combs which the care of their brood requires. But this is not all. Not only do they elongate the cells of the old combs when there is an extraordinary harvest of honey, but they actually give to the new cells which they construct on this emergency a much greater *diameter* as well as a greater depth.

"The queen-bee in ordinary circumstances places each egg in the centre of the pyramidal bottom of the cell, where it remains fixed by its natural gluten; but in an experiment of Huber, one whose fecundation had been retarded had the first segments of her abdomen so swelled that she was unable to reach the bottom of the cells. She therefore attached her eggs (which were those of males) to their lower side, two lines from the mouth. As the larvæ always pass that state in the place where they are deposited, those hatched from the eggs in question remained in the situation assigned them. But the working-bees, as if aware that in these circumstances the cells would be too short to contain the larvæ when fully grown, *added to their length*, even before the eggs were hatched.

"Bees close up the cells of the grubs, previously to their transformation, with a cover or lid of wax; and in hanging its abode with a silken tapestry before it assumes the pupa state, the grub requires that the cell should not be too short for its movements. Bonnet having placed a swarm in a very flat glass hive, the bees constructed one of the combs parallel to one of the principal sides, where it was so straight that they could not give to the cells their ordinary depth. The queen, however, laid eggs in them, and the workers daily nourished the grubs, and closed the cells at the period of transformation. A few days afterwards he was surprised to perceive in the lids holes more or less large, out of which the grubs partly projected, the cells having been too short to admit of their usual movements. He was curious to know how the bees would proceed. He expected that they would pull all the grubs out of the cells, as they commonly do when great disorders in the combs take place. But he did not sufficiently give credit to the resources of their instinct. They did not displace a single grub — they left them in their cells; but as they saw that these cells were not deep enough, they closed them afresh with lids much more convex than ordinary, so as to give to them a sufficient depth; and from that time no more holes were made in the lids.

"The working-bees, in closing up the cells containing larvæ, invariably give a convex lid to the large cells of drones, and one nearly flat to the smaller cells of workers; but in an experiment instituted by Huber to ascertain the influence of the size of the cells on that of the included larvæ, he transferred the larvæ of workers to the cells of drones. What was the result? Did the bees still continue blindly to exercise their ordinary instinct? On the contrary, they now placed a nearly *flat* lid upon these large cells, as if well aware of their being occupied by a different race of inhabitants.

"On some occasions, bees, in consequence of Huber's arrangements in the interior of their habitations, have begun to build a comb nearer to the adjoining one than the usual interval; but they soon appeared to perceive their error, and corrected it by giving to the comb a gradual curvature, so as to resume the ordinary distance.

"In another instance, in which various irregularities had taken place in the form of the combs, the bees, in prolonging one of them, had, contrary to their usual custom, begun two separate and distant continuations, which in approaching instead of joining would have interfered with each other, had not the bees, apparently foreseeing the difficulty, gradually bent their edges so as to make them join with such exactness that they could afterwards continue them conjointly." — pp. 576, 577.

We observe in all these instances, that neither the ruling purpose, which is the preservation and nourishment of their young, nor the general form and character of the cradle-cell, is ever changed. The bees can modify their work just enough to avoid what may be termed the ordinary casualties of the hive. When extraordinary disorders in the combs take place, such as cannot be met by slight repairs or trifling changes, Huber tells us that they pull the grubs out of the cells to perish, demolish the structure, and begin anew. We quote a portion of the authors' very just remarks on these slight variations of instinct.

> "Bees cemented their combs, when becoming heavy, to the top of the hive with mitys, in the time of Aristotle and Pliny, as they do now; and there is every reason to believe that then, as now, they occasionally varied their procedures, by securing them with wax or with propolis only, either added to the upper range of cells, or disposed in braces and ties to the adjoining combs. But if in thus proceeding they were guided by reason, why not under certain circumstances adopt *other* modes of strengthening their combs? Why not, when wax and propolis are scarce, employ *mud*, which they might see the martin avail herself of so successfully? Or why should it not come into the head of some hoary denizen of the hive, that a little of the *mortar* with which his careful master plasters the crevices between his habitation and its stand might answer the end of mitys? 'Si seulement ils élevoient une fois des câbanes quarrées' (says Bonnet, when speaking as to what faculty the works of the beaver are to be referred), 'mais ce sont éternellement des câbanes rondes ou ovales': and so we might say of the phenomena in question — Show us but *one* instance of bees having substituted mud or mortar for mitys, pissoceros, or propolis, or wooden props for waxen ties, and there could be no doubt of their being here guided by reason. But since no such instance is on record; since they are still confined to the same limits — however surprising the range of these limits — as they were two thousand years ago; and since the bees emerged from their pupæ but a few hours before will set themselves as adroitly to work, and pursue their operations as scientifically as their brethren, who can boast the experience of a long life of twelve months' duration; — we must still regard these actions as variations of instinct." — p. 583.

Instincts have sometimes been called *innate habits*, and it must be confessed that the parallel thus indicated is a very just and striking one. Cuvier long since remarked, that animals guided by instinct appear, like a man in a dream, to be haunted by one idea, or, like a somnambulist, to perform a very difficult task without being conscious of it. In the human mind, frequent repetition appears to unite the parts of a long and complex mental process into one whole, so that the several volitions that are required follow each other with as much order and facility as if they were links of the same chain. There is no need of delay in order to dwell upon any part of the operation, and consider what is to be done next. The needful step is suggested precisely at the right moment, and instantly performed, so that we have no recollection that any effort of the will was necessary, and we say that the whole was performed unconsciously. Thus, an absent-minded man may undertake a long walk by a route with which he is perfectly familiar, his mind being occupied all the while with some knotty subject of thought which has nothing to do with the cause of his excursion ; and he arrives safely at the desired point, without being aware of the bodily exertion he has made, or of having paid a moment's attention to a single object on the road or to a single incident of his journey. There may be several diverging routes, yet he constantly selects the right path, without being aware that he has ever exercised a choice. At each step, a distinct volition is required to lift his foot from the ground ; but he is no more aware of it than a rapid writer is that a separate determination of the will is necessary for the smallest stroke or curve in every letter in his manuscript. Speaking fancifully, we may say that there is a latent idea in his mind, never rising into the sphere of consciousness, which still governs every motion of his will, and brings out the desired result at last, though the man himself is as ignorant of the process whereby it was obtained as if he was a mere machine. The very phrase "absent-minded" implies that his mind had nothing consciously to do with any part of the operation.

The bee, in constructing the comb, works like a somnambulist, or like this person laboring under absence of mind. It reflects not upon the object of its labors ; for, having had the experience but of one season, or perhaps of one day, it knows not what that object is. Foresight it has not, unless it be the foresight of a god rather than a man ; for human foresight is nothing but the reflection of past scenes upon the mirror of the future. It is not conscious of design or contrivance ; for this implies preconceived ideas of ends not yet realized, and such ideas we have seen it cannot possess. The bee toils on just as unconsciously as the man moves his limbs in that dreamy walk ; there is a purpose, a useful end, to be obtained by the exertion, but neither of them is aware of it at the moment. In the man, indeed, the purpose was preconceived, and it will come back to his mind at the end of the walk. The bee knows nothing of a purpose, but toils on as an humble instrument in the hands of another. Its vocation is that only of the common laborer, to bring bricks and mortar for the construction of those wonderful cells which are built by a divine architect, the same who fashioned the curious mechanism of the bee's own body, and who appears in this instance at least, if not in every other, constantly superintending and acting in his own works.

A writer in the Zoological Journal for 1824, Mr. J. O. French, who has speculated very boldly on the metaphysical part of our subject, supposes the fundamental distinction between the human and the brute mind to consist in the want of ability, on the part of the latter, to become objective to itself, or to reflect upon its own moral and intellectual qualities as such, or as proper objects in themselves considered of desire or aversion. When stated in this form, the theory appears objectionable, because it must ever remain destitute of proof; supposing that animals did possess this faculty, they could never manifest it to man, for, the process being purely intellectual, it can be made known to others only by language ; brutes have no power of communicating pure thought. The fact, that the animal mind does not improve, or that it has no power of educating itself, is held to indicate this defect; but there are many other supposable imperfections in the mental constitution which are equally inconsistent with the power of self-improvement. Consciousness of defect may or may not suggest the means of progress or melioration. Mr. French's theory, in truth, amounts to no more than this, that animals never act from reflection, but always from impulse. They will certainly make no progress, if they act in this manner. To recur to the illustration just given, the operation that is continued from the mere force of habit will never be improved. If our pedestrian suddenly quickens or slackens his pace, it is a sure sign that he has begun to think about the object of his journey. So a practised musician may play a familiar tune without appearing to bestow any attention upon it ; though the required movements of the fingers are very swift, and it is certain that a distinct volition is required for every touch, he will continue to converse upon some indifferent topic with as much apparent readiness as if his hands were at rest. Yet most certainly he will never become a better musician than he is at present, if he continues to play only in this manner. In order to improve, he must pause and dwell upon the process, note the defects in his execution, and by distinct and conscious effort try to remove them.

Here we see an obvious reason why the instincts of animals do not become more acute and remarkable, as they advance in age. Acting under them as a man acts when guided only by habit, ignorant of the object of their toil, and therefore never reflecting upon the best means for attaining that object, their last labor is precisely like their first. Their physical powers improve ; the dog and the horse, by practice, become more swift, and the senses of the elder animals often appear more acute than those of their young. But their instincts are unchangeable, and consequently, when not trained by man, their *modes* of operation are never altered.

But how do we account for the great changes and improvements of which they are undoubtedly susceptible, under regular training, when man seeks to increase their powers, in order that they may become more convenient instruments of his will ? It will probably be found that all the marvellous changes effected in this way are attributable to the imitative faculty, and to the continued association of reward or pleasure with one class of actions, while punishment is invariably connected with others. That animals are often governed by sympathy, and show a strong propensity to mimic the actions of their fellows as well as of other animals, is a familiar fact. The monkey has become proverbial for his inclination to mimicry ; most singing birds may be taught portions, at least, of regular tunes ; and wild animals generally are most easily tamed, when in the company of their domesticated brethren. The wonderful feats which they may be brought, through much labor and attention, to accomplish in this way, are no proofs whatever of the existence of the reflecting faculty, or of any of the higher endowments of mind. Sympathy and imitation often appear as blind propensities even in man. A yawn will often pass round quickly, through a whole circle of companions, without one of them being conscious of it. "The mob," to quote an instance from Adam Smith, "when they are gazing at a dancer on the slack rope, naturally writhe and twist and balance their own bodies, as they see him do, and as they feel that they themselves must do, if in his situation." In such cases, to use a common phrase, the spectators do not know what they are about ; for such contortions being wholly useless, both to themselves and to the dancer, if conscious of the movement, they would repress it. This faculty of unconscious imitation is a most useful endowment of our nature ; for, by its aid, the infant makes some of its earliest and most important steps in knowledge. As some of the most remarkable exhibitions of it in man are blind and purposeless, we may reasonably conclude that it is always so in the brute.

Feats which animals have been trained to accomplish, therefore, afford no proof that they possess one spark of intelligence. How little weight, then, is due to the ingenious speculations of the author of The Vestiges of Creation, who argues that the human and the brute mind must be of the same species, because a mountebank had taught his two dogs how to play dominoes ! It appears strange that he did not also adduce the instance of the Learned Pig, in order to prove that swine may be taught to spell. An animal blindly repeats some movement, which a man performs only from a perception of its true meaning and purpose ; we must not, therefore, attribute such a perception to the brute. Parrots may be taught to articulate, but they do not thereby learn to talk. A monkey in a painter's studio will seize his brush and cover the walls of the room with unmeaning scrawls ; it imitates the physical act, but without any glimpse of its intention and real character. The comparative teachableness of the different tribes seems to depend on the strength of the imitative propensity, and on the want of fierceness or fickleness of disposition. The monkey can very readily be taught, but its excessive fickleness soon dissipates all the effects of instruction. The mocking bird can be made to repeat snatches of many tunes, but it will hardly ever sing one entirely through, though this is done by the bulfinch and the Canary bird. The gravity and steadiness, so to speak, of the elephant's disposition, and the keenness of its senses, united with its perfect gentleness and imitative talent, render it very susceptible of instruction ; and the docility of its pachydermatous brother, the hog, Dr. Darwin thinks has been much underestimated. By observing such qualities as these, we shall find much reason to doubt the alleged natural sagacity of certain species. That they learn more readily is no proof of higher natural endowments, when the lesson is repeated blindly and mechanically, and enforced by no perception of its useful results, but by a dread of hunger or the whip.

The acquired habits of domesticated animals mostly override and conceal their natural inclinations, so that it appears questionable whether they possess as many or as striking instincts as some wild brutes which are certainly inferior to them in the scale of being. Many of these instincts, also, are of a social character, and therefore can be manifested only when the individual is in the wild herd with its fellows. Thus, the domestic horse, though very gentle, seems much inferior in intelligence to the dog, the cat, or the elephant ; its life of service is a very constrained and artificial one, being passed almost constantly in harness or in the stall, while the other favorite attendants of man still enjoy considerable range and license of movement. It is even supposed that instinct becomes more varied and exquisite, the lower an animal is in the scale of being. This is true, if we look only at the great divisions of the scale ; the instincts of birds are more remarkable than those of the mammalia, while the insect in the same way exceeds the bird. But within these classes, instinct seems quite capriciously distributed, if we look only at the anatomical development of the animal, and not at the wants of its peculiar situation and mode of life. The common theory, that instinct exists only as the supplement, or in the inverse ratio, of the intelligence, certainly admits of numerous exceptions. At the bottom of the scale, among the radiata, we find hardly any signs either of intellect or instinct ; and among beasts of prey, those which are less strong and swift are led by instinct to use more curious stratagems in order to obtain their ends. We attribute these stratagems to instinct rather than to intelligence, because many species can use but one or two modes of ensnaring their prey, and show little or no power of adapting these to circumstances.

In one degree or another, instinct is displayed by all the animals inferior to man. We find the plainest marks of it precisely where one would expect to see them, among the means provided for the continuation of the species. We see it in the young of all the mammalia, who find and suck the dugs of the mother immediately after birth. What directs the young colt or the calf, at once, to the only source of its proper nourishment for the time ; or why does it not attempt to crop the herbage for food, like its dam? Why does maternal affection cease, just at the time when the offspring becomes capable of taking care of itself, and then cease so entirely that the animal seems incapable ever afterwards even of recognizing its own young ? How many other instincts are naturally conjoined with these it is impossible to tell, because we cannot study minutely the habits of the animal in its wild state, where alone these wonderful powers are freely manifested. Man's officious care teaches them artificial habits so soon, or removes so diligently the occasion for the development of their instincts, that we can learn little from them in this respect while they are under his tutelage.

In one respect, however, they are admirably fitted by nature's cunning hand for all the exigencies of their situation immediately after birth, while the human infant is left to perfect itself by the slow inductions of experience, under the fostering care of its elders. The first and most important step in the acquisition of knowledge by man is to acquire the use of his own eyes, or to learn how to *see*. It is a fact now firmly established, both by *a priori* reasoning and observation, that the eye directly sees nothing but colors, and cannot perceive immediately either distance, figure, dimension, or situation. Colors are the only visible things, just as sounds alone are audible ; experience teaches us from slight variations or peculiarities of these to *infer* the distance, magnitude, shape, or other tangible qualities of the objects which possess or emit them. This fact, first discovered by Berkeley, has been demonstrated by experiments on persons born blind and subsequently restored to sight, and may be confirmed at any time by watching the movements of an infant soon after its birth. Place some bright or gaily-colored toy before its eyes, and its looks and movements instantly betray its desire to grasp it, and if the object be actually placed in its hands, it will hold it firmly, and seem unwilling to relinquish it ; but hold it at a little way off; and the hands grope for it, seemingly at random, or in a manner which shows the infant's entire ignorance of its distance and true position. The child betrays the same uncertainty, when it attempts to convey anything to its mouth ; place the object in contact with its lips, and it will eagerly seize it. If its bungling attempts be attributed, in part, to its ignorance of the right mode of using its arms and hands, — to its incapacity, in fine, to make any proper *use* of them, — this only places in a stronger light its inferiority, for the time, to the young brute. In the beautiful experiment already quoted from Galen, the kid just snatched from the *matrix* of its dead mother used its limbs at once, with perfect facility and success, and with the characteristic movements of its species. Like the newly born colt or calf, also, it walked with freedom, inspected objects near at hand, and avoided those which were in its way, — not, as in the case of man, with an acquired judgment, but with an instinctive knowledge of their true position.

The ability of the inferior animals to see distances as soon as their eyes are opened is so evident, that Mr. Bailey has recently alleged this fact in an attempt to controvert Berkeley's whole theory of vision, as applied to man. He might as well adduce the innate constructive power of the bird and the bee, as a proof that men know how to build houses by intuition, or without the aid of experience. The ancient anatomists committed many errors in attempting to learn the internal structure of the human body by dissecting the carcasses of brutes. Yet no anatomical differences are so striking as the entire want of similitude between instinct and reason ; the one being blind, unconscious, invariable, and infallible, — while the other is self-taught, cognizant of its own actions, constantly liable to error, but capable of indefinite progress. Berkeley's theory is susceptible of demonstration, from the laws of light and the physical structure of the eye, independently of any experiments. The eye certainly can determine the distance of an object only by a line directed endwise to itself, and such a line, be it longer or shorter, projects but one point upon the retina. By what means, then, can a man ascertain the length of that line ? Instinct cannot inform *him* of its true measurement ; for he is constantly deceived, when guessing at the distance of an object of the size of which he is ignorant, especially when it is separated from him by a vertical, instead of a horizontal line. Every one who has seen a well executed diorama knows, that, by a skilful distribution of light and shade, not only in the painting itself, but also in the apartment in which it is viewed, a flat surface, perpendicular to the horizon, is immediately transformed, to the eye, into an extensive landscape, and hardly the most vigorous exertion of the judgment can correct the illusion. Here is a direct proof that the eye does not immediately see *distance*, and every one knows that the visible *magnitude* of an object depends on its remoteness. Yet chickens, as soon as they are out of the shell, run about, evidently with an immediate perception of the relative size and proximity of all the objects around them.

We have now shown, not merely that all the inferior animals are copiously endowed with instincts, but that there is good reason to suspect man to be absolutely devoid of them, or to be guided by reason alone. If, in so important a respect as the use of his eyes, on which he is dependent for safety, as well as progress, at almost every moment of his existence, while by their aid alone can his other faculties attain their full development and the extreme limit of their usefulness,— if on this cardinal point he is left entirely to the slow deductions of experience, we may well believe that in no other particular, in his case, is instinct allowed to supersede the use of reason. The utter helplessness of the human infant, compared with the independence of the young of most other animals, appears in nothing so strongly as in its inability to see, even when its eyes are opened and the physical structure of the organ is perfect.

In fact, after we have deprived the passions and appetites, for reasons already given, of all claim to the character of instinct, there is no instance commonly adduced by physiologists to prove that man is ever governed by it, except the action by which he first acquires nourishment. And even here it is admitted, though the act of sucking be instinctive at first, yet if the propensity be not very soon developed and confirmed by experience, that it ceases altogether. At the utmost, then, this is a transient instinct, given to provide for man's safety in the first helpless hours of his existence. But it is very doubtful whether even this action is properly to be called instinctive. Recurring to the definition already given, is it certain that this is an instance of action not pleasurable in itself alone, but useful only as a means for some ulterior object? That mere muscular exertion is pleasant in itself is evident enough to one who observes the uneasiness of infants and the strange gymnastic experiments of children of a little larger growth. If a small object be placed in the hand of an infant, its little fingers readily close around it, apparently from the mere pleasure of calling the muscles into activity.

The sphincter muscle of the mouth may do the same, when any object comes within its grasp ; and then the child needs but a single inspiration, which automatically recurs at every instant, with perhaps a little aid from the parent, in order to have its first pleasant experience of the gratification of appetite. When this pleasure has been a few times repeated, the habit, aided by the uneasiness of hunger, becomes so strong, though at the same time so blind, that the infant eagerly sucks every object presented to its mouth. It is this eagerness, manifested at so early a period, which has led most observers to consider the action as instinctive.

When the means are very closely connected with the end, it is often difficult, as in the case of sucking, to say whether the action is properly instinctive, or the result of mere appetite. In respect to the instincts of animals this doubt seldom arises ; for in most of them the means are separated, so to speak, by a wide interval from the end, the utility of the action being wholly prospective. Thus, the bee builds an unusually large cell for the accommodation of a future queen, though the royal egg be not laid yet. It is very certain that there are no instincts of this sort in man. In the case of animals, too, the means are often complex and intricate, as well as far-reaching ; while in the commonly alleged instance in the human subject, the means are of the simplest character, the result, most probably, of a single volition. We have, then, only to suppose this simple action to be agreeable in itself, and it ceases to be a means, and the act loses every characteristic of instinct. If agreeable food be placed in the mouth, the gratification of the palate, or the inconvenient position of the food, especially if it be liquid, when it comes near the œsophagus, may lead to the attempt to swallow it. Deglutition certainly is not a very complex process ; and the infant's first few experiments in this way, as its posture usually brings the power of gravitation to aid it, may reasonably be thought sufficient to render it soon very expert in the process. Dr. Darwin maintains that the fœtus learns to swallow by its experience *in utero*. Whatever may be thought of this opinion, it is certainly more plausible than that of Dugald Stewart, who ascribes the operations not only of suction and swallowing, but even of respiration, to instinct. He mentions the fact, that thirty pair of muscles must be employed in every draught, and seems to believe that a distinct volition is required for the movement of each pair; though the well known facts respecting the catenation of the muscular actions might have convinced him of the absurdity of such a theory. It is quite remarkable that a philosopher, usually so well informed and so judicious, could make the following statement: —

> "An infant, the moment it is brought into the world, performs *with the most perfect success* the function of respiration; a function which requires the alternate contraction and relaxation of certain muscles in a regular order and succession. The infant has certainly no idea that breathing is necessary to life, nor any knowledge of the means by which that end is accomplished." — *Philosophy of the Mind*, Vol. III., p. 242, Am. ed.

Having already pointed out the error of confounding the phenomena of life with those of instinct, we may pass over this strange passage without further comment. Some remote and beneficial purpose is always answered by the gratification, within due limits, of all the appetites; yet the act is performed not from a regard to that purpose, but under the immediate impulse of blind desire. Thus, taking food preserves life; yet men do not usually eat because they are afraid of death, but because they are hungry. Great uneasiness or pain is the consequence of an attempt to hold the breath for a single minute; so far as the act is at all under the control of the will, we breathe to avoid this pain. But the act of respiration, in great part, is unquestionably mechanical, — as much so as the beating of the heart, or the secretion made by the liver.

Whether we have rightly limited the meaning of the *word* instinct, so as to exclude from it all operations of this class, all the appetites and passions, and the indirect consequences of gratifying them, is a question which relates merely to the propriety of language, and does not at all concern the truth of our present theory. It has now been conclusively shown, if we mistake not, that a class of phenomena are manifested by the lower animals, which may be as sharply distinguished from the effects of human reason, on the one hand, as from those of appetite and natural desire on the other; and these phenomena alone are attributed to a power which we have chosen, for the purposes of convenience, to call instinct. Give it any other appellation, and it will answer the purpose just as well. All the lower animals manifest it, — man never does ; — these are the only propositions with which we are now concerned.

The Scotch school of metaphysicians, which Mr. Stewart adorned with his learning and the graces of his character and style, more than with the novelty of his views or the profundity of his reasoning, is noted for its inclination to multiply the number of ultimate and unaccountable facts in human nature. In so doing, they have often, in popular phrase, "found a mare's nest," or made a great mystery out of a very simple thing. Stewart's *naïve* astonishment, that an infant, as soon as it comes into the world, should know how to breathe "with the most perfect success," is certainly an amusing instance of this weakness. The instinct of brutes is, doubtless, a mysterious faculty ; and the Scotch philosophers have therefore sought with great eagerness for proofs that this marvellous power belongs also to man. But they have not met with great success in the undertaking. Both Reid and Stewart consider the propensity to unconscious imitation, on which we have already remarked, as an instinct ; we have classed it rather with the appetites and passions, which are the concomitants of instinct in animals, and of reason in man. And the reason for this classification is obvious. The *desire* or propensity to imitate is natural or connate ; the *power* of imitating successfully does not appear at all in the outset, is slowly acquired by observation and experience, and may be perfected by study and practice.

We have now considered all the instances that we can find adduced, either by physiologists or metaphysicians, to show that man is ever directed by instincts like those of the brute. These instances are all referable to the phenomena of life, the teachings of experience, or the class of appetites. Human nature shows no trace whatever of that marvellous power which governs the bee in the construction of its cell, and guides the migrating bird in its long flight to its winter home. But man is the only being who is not under its influence ; every other animal, from the noblest quadruped to the humblest insect, gives frequent indications of its presence and control. So numerous and striking, indeed, are the manifestations of it by every species, that there appears good reason to doubt whether it is ever mingled, even in them, with what can properly be called intellect ; whether all the marvellous cases of reputed sagacity and intelligence in the higher animals may not be resolved, after all, into a mere blind propensity to imitate actions, the purpose and meaning of which they cannot understand, or into an instinct more flexible and varied, indeed, than that of the lower species, but which still shows distinctly that it is radically different from reason. But it is hard to prove a negative ; and in this case, it would be necessary to analyze an indefinite number of supposed manifestations of intelligence by brutes, and to show that they may all be explained by the action of those blind and unconscious powers which certainly govern far the greater part of their actions. Without entering upon this laborious and difficult task, we leave this point to rest upon the single consideration of the striking improbability of the lower animals being endowed with reason, which they need to exercise only on infrequent and extraordinary emergencies, while all the ordinary occasions of their being, their wants, dangers, and the preservation of their species, are provided for by the lower attributes with which they are specially endowed. These certainly suffice for the most wonderful works that are performed by them ; the whole insect tribe unquestionably knows no other guide than instinct ; and if this power be enough to account for the actions of the ant and the bee, we hardly need seek any other key to the supposed sagacity of the dog and the elephant, as they also possess it, and nearly all their conduct must be referred to its control.

But the negative on the other side is more easily supported, and by direct evidence. However it may be with the brute, reason is not mixed with instinct (properly so called) in man. We have the immediate testimony of consciousness, that we never select means until experience has informed us of their efficacy, and never use them but with a full knowledge of their relation to the end. If instinct, then, be radically unlike intelligence, the question respecting the nature of the difference between the human and the brute mind is answered, at least, so far that we may safely declare the difference to be in kind, and not merely in degree. The relation between the works of man and those of the brute, considered as indicating the powers which produce them, is a relation of analogy, but not of affinity. The architecture of the bee is equal, is even superior, to that of man, and perfectly similar purposes are answered by the two structures ; but they are erected by totally different means.

Each of the qualities of instinct on which we have remarked is a peculiarity of it in respect to reason, and serves to distinguish it from that faculty by a line more or less broad; while the aggregate of these peculiarities shows conclusively that the difference between the two is fundamental. This will appear more clearly from a summary of the several points which we have considered. It has been shown, then, that instinct exists before experience, and is wholly independent of instruction; that it is not susceptible of education or improvement of any kind, either in the individual or the race; that it works successfully towards important and remote ends by the use of complex and laborious means, yet without any apparent consciousness of the difference between means and ends; that it acts, in truth, by impulse, and not through reflection, — at least, as much so as the man who has gained by habit the power of performing a long operation without reflecting on any part of it; that it is limited to a few objects, and out of the narrow sphere of work required for these objects it is wholly powerless; and that, consequently, it appears in the same animal, and at the same time, both as the most brutish stupidity and as the highest wisdom, in so far as its creations shame the utmost ingenuity of man. As we are confessedly ignorant of the internal constitution of both faculties, reason and instinct, and are reduced to judge of them exclusively by their outward manifestations, it is difficult to conceive of two powers which should appear more radically unlike.

It is easy to give the reins to conjecture respecting the inward essence or ultimate cause of a faculty which appears to human reason so anomalous. Though theories formed in this manner, so far as they profess to be complete, must be equally unsusceptible of proof or disproof, and are therefore idle exercises of ingenuity, yet one or two points, perhaps, may be satisfactorily made out respecting the mental constitution of brutes, which will afford us a glimpse of the final end of their being. Whether instinct be the mere action of a curious machine, or the effect of the constant agency and promptings of the Deity, or the working of some still more secret principle, which is nowhere manifested but in animal life, it is not a free and conscious power of the animal itself in which it appears and works. It is, if we may so speak, a foreign agency, which enters not into the individuality of the brute. The animal appears subject to it, controlled and guided by it, but not to possess and apply it by its own will for its own chosen purposes. We cannot conceive of wisdom apart from reflection and consciousness ; there is an absurdity in the very terms of such a statement. The skill and ingenuity, then, which appear in the works of the lower animals are not referable to the animals themselves, but must proceed from some higher power working above the sphere of their consciousness. This assistance is meted out to them for specific and limited ends, and has no effect on the rest of their conduct, which is governed by their own individuality. In its highest functions, the brute appears only as the blind and passive instrument of a will which is not its own. The power is granted to it for a time, but is not susceptible of improvement by practice while in its keeping, is invariably applied in the same way and with perfect success, and is withdrawn as soon as the purposes for which it was given are answered. No moral character is attributable to a faculty which is unconsciously exerted, and no moral aim can exist where progress or change is impossible. When deprived of this extraneous power, or viewed apart from it, the brute appears in its true light, as the creature of a day, born not for purposes connected with its own being, but as an humble instrument, or a fragmentary part, in the great circle of animated nature, which, as a whole, is subservient to higher ends.

ART. IV. *The Life of Louis, Prince of Condé, surnamed the Great.* By LORD MAHON. New York : Wiley & Putnam. 1845. 2 vols. 12mo.

SOME have been skeptical as to the existence of cannibals, not being able to comprehend how man, with the sharpest appetite, can get up a relish for the sort of food attributed to them ; and yet, in the nature of things, it must be more excusable to destroy human life for the sake of a dinner, when one is in desperate want of it, than to sacrifice it to mere ambition. And the time will probably come, when readers will find it hard to conceive that creatures ever should have existed, who made it their sole business and pleasure to vio-